

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
26 May 2005 (26.05.2005)

PCT

(10) International Publication Number
WO 2005/046445 A3

(51) International Patent Classification⁷: A61F 2/02,
2/06, C12N 15/09, 15/63, 5/00

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW

(21) International Application Number:
PCT/US2004/037302

(22) International Filing Date:
5 November 2004 (05.11.2004)

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE,
SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/518,412 7 November 2003 (07.11.2003) US

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Published:

- with international search report
- with amended claims

(88) Date of publication of the international search report:
2 February 2006

Date of publication of the amended claims: 23 March 2006

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: ARTIFICIAL TISSUE SYSTEMS AND USES THEREOF

(57) Abstract: An implant system and a method for controlling the natural and artificial microenvironments surrounding an implanted device using an artificial tissue system (ATS) and includes methods of diagnostic and testing related thereto. The ATS, among other things, induce better integration, function, and extended lifespan of the devices at the site of implantation. The ATS includes cells, such as naturally occurring, engineered, and/or artificial cells; matrices such as natural, engineered, artificial and/or hybrid matrices; tissue response modifiers (TRM); and/or cell response modifiers (CRM). The specific composition of the ATS is based on the nature of the tissue in which ATS-device combination is implanted and the nature of the implant device, as well as the required function and lifespan of the implanted device. Additionally, the ATS, as well as ATS-device combinations can be utilized *in vitro* to aid in the design of improved ATS, devices and ATS-device combinations for *in vivo* uses.

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